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Susan M. Donahue
Rockwell Automation, 704-P, IP Department
1201 South 2nd Street
Milwaukee, WI 53204

EXAMINER	
ORTIZ RODRIGUEZ, CARLOS R	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/674,966	DISCENZO ET AL.	
	Examiner	Art Unit	
	CARLOS ORTIZ RODRIGUEZ	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *26 October 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-10,12,13,15-17,19-35 and 39-49* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-10,12,13,15-17,19-35 and 39-49* is/are rejected.

7)☒ Claim(s) *3, 5, 8, 10, 15 and 33* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/26/09*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-10, 12-13, 15-17, 19-35 and 39-49 are pending.

2. Claims 11, 14, 18 and 36-38 are cancelled.

Response to Arguments

3. Applicant's arguments filed 8/11/09 have been fully considered but are moot in view of the new ground(s) of rejection.

Terminal Disclaimer

4. Please note that a new terminal disclaimer needs to be submitted. The terminal disclaimer filed on 8/11/09 does not comply with 37 CFR 1.34 and 37 CFR 1.321(b) and/or (c). An attorney or agent, not of record, is not authorized to sign a terminal disclaimer in the capacity as an attorney or agent acting in a representative capacity as provided by 37 CFR 1.34. See 37 CFR 1.321(b) and/or (c).

Claim Objections

5. (Claim 3 Line 1) objected to because of the following informalities: It is not clear if claim 3 depends on claim 2, claim 1 or claim 21. It appears to be that, when making the amendment, Applicant forgot to delete the number “1”. Therefore, for examination purposes, it is being assumed that claim 3, depends on claim 2. Appropriate correction is required.

6. (Claim 5 Lines 1-2) objected to because of the following informalities: The term “the prognostics prognostic components performs" appears to be "the prognostic components performs” in order to maintain consistency throughout the claims (see Claim 4 Line 2). Appropriate correction is required.

7. (Claim 8 Lines 2) (Claim 9 Lines 2) objected to because of the following informalities: The term “and/or components" should be deleted in order to maintain consistency with the current amendment to Claim 1 Line 7. Appropriate correction is required.

8. (Claim 10 Line 2) objected to because of the following informalities: The term “environment" would be better if deleted in order to better provide antecedent basis for the term "industrial automation system", which is used later in the claim(s). Appropriate correction is required.

9. (Claim 15 Lines 1-2) (Claim 22 Lines 1-2) objected to because of the following informalities: The term “wherein controlling the industrial automation system according to” would be better if written as “wherein controlling the at least one machine according to”, in order to maintain consistency throughout the claims (see for example Claim 10 Line 17 where it mentions “controlling at least one machine”). Note that “controlling the

industrial automation system" is not previously mentioned. Appropriate correction is required.

10. (Claim 33 Line 3) objected to because of the following informalities: The term "data form" appears to be "data **from**". Appropriate correction is required.

Claim Rejections - 35 USC § 112

11. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

12. Claims 2, 3, 7, 6, 7, 21, 22, 24-29, 44 and 45 rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Specifically:

a. Regarding (claim 2 line 2) please note that the claim has two periods, therefore it is not clear which one of the two limitation should be considered for examination.

b. Regarding (Claim 6 Line 1) please note that it recites the limitation "the prognosis prognostic **engine**". There is insufficient antecedent basis for this limitation in the claim.

c. Regarding (Claim 7 Line 2) please note that it recites the limitation "the inference". There is insufficient antecedent basis for this limitation in the claim.

d. Regarding (Claim 40 Line 8) please note that it recites the limitation "the industrial automation system **machine**". There is insufficient antecedent basis for this limitation in the claim.

e. Regarding (Claim 44 Line 18) please note that it recites the limitation "the industrial **automation system**". There is insufficient antecedent basis for this limitation in the claim.

f. (Claims 21, 22 and 24-29) are unclear because claim 21 recites the limitation "selecting the desired operating point as the optimum efficiency **performance point** within the allowable range of operation according to the correlated system performance information", in lines 5-6. Note that base Claim 10 recite the limitation "selecting a desired operating point as an optimum **efficiency point** within an allowable range of operation about a system set point according to the correlated system efficiency information", in lines 14-16. It is not clear how the "desired operating point" is selected to be both the "optimum efficiency **performance point**" and the "optimum **efficiency point**". Therefore, dependent claims 22 and 24-29 are unclear for the same reason.

Claim Rejections - 35 USC § 103

13. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which

said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

22. Claims 1, 2, 4-6, 8-9, 39, 44, 45 and 47-49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reid et al. U.S. Patent No. 6,298,308 (hereinafter Reid) in view of Hays et al. U.S. Patent No. 6,330,525 (hereinafter Hays).

a. **Regarding claim 1**, Reid discloses a system that optimizes industrial business operations, comprising: a processor; a memory communicatively coupled to the processor, the memory having stored therein computer-executable instructions configured to implement the industrial business operations including: a component that receives data relating to a plurality of machines that are part of the industrial business operations (C3 L32-34, see for example data collecting and analyzing).

But Reid fails to clearly specify: an optimization component; obtaining a system set point, an allowable range of operation and machine performance information; selecting a desired operating point within the allowable range of operation about the system set point according to performance characteristics associated with the industrial business operations; and controlling the industrial business operations in part according to the desired operating point; and a correlation engine that analyzes data.

However, Hays teaches an optimization component; obtaining a system set point, an allowable range of operation and machine performance information; selecting a desired operating point within the allowable range of operation about

the system set point according to performance characteristics associated with the industrial business operations; and controlling the industrial business operations in part according to the desired operating point; and a correlation engine that analyzes data (C20 L56-58, note that in order to adjust and control the pump operation so that it could operate closer to the best efficient point, BEP, it is necessary to obtain a set point, an allowable range operation about the set point, and finally select an operating point within the allowable range. Note that the components of the system characterize the machine performance information and the allowable range of operation).

Reid and Hays are analogous art because they are from the same field of endeavor. They both relate to diagnostic systems.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings disclosed by Reid and combining them with the teachings disclosed by Hays.

One of ordinary skill in the art would have been motivated to do this modification in order to effectively determine the root cause for bearing failure of rotating equipment as suggested by Hays (see for example, C5 L54-56).

Please note that in order to secure a desired operating characteristic and properly control a system it is necessary to obtain machine characteristic information and the allowable range of operation of the machine. It is known in this art that a system set point should be within the allowable range of operation and any other desired operating point should also be within the allowable range

of operation. The allowable range of operation and the machine performance information of the system depends on the components that makeup the system.

Please note that the term "to correlate operation among the plurality of machines for a global optimization of the plurality of machines as a whole" is being considered as an intended use.

b. **Regarding claim 2**, the combination of Reid and Hays discloses all the limitations of the base claims as outlined above. Reid further discloses a host computer that executes a prognostic engine (Fig 3 and C13 L24-43, see for example that the local expert are computer driven entities that serve as host and receive data from up to thirty-two different machines located at the site). Please note that due to the unclear language that this claim has, as indicate above in item 12a of this Office action, for examination purposes the second limitation is being addressed.

c. **Regarding claim 4**, the combination of Reid and Hays discloses all the limitations of the base claims as outlined above. Reid further discloses at least a subset of the plurality of machines comprising prognostic components that collaborate in a distributed manner (Fig 2 and C8 L11-17 and C14 L10-15, see for example that the local experts communicate shared or individually; also see

that the local experts could be mounted separate and apart form the respective machines or they could be mounted on each machine).

d. **Regarding claim 5**, the combination of Reid and Hays discloses all the limitations of the base claims as outlined above. Reid further discloses at least one prognostic components performs prognoses for a cluster of machines (Fig 1-2 and C2 L47-49 , note that a group of machines is being interpreted as a cluster of machines. See for example that the local expert is connected to thirty-two different machines).

e. **Regarding claim 6**, the combination of Reid and Hays discloses all the limitations of the base claims as outlined above. Reid further discloses a prognostic engine and a prognostic components collaborating to improve operating rate of at least a subset of the plurality of machines (C2 L57-61, see for example that the diagnoses performed by each local expert can be used to alert appropriate personnel of impending failure, wear and necessary maintenance in order to improve the operating rate of the machines).

f. **Regarding claim 8**, the combination of Reid and Hays discloses all the limitations of the base claims as outlined above. Reid further discloses at least a subset of the plurality of machines are represented by intelligent agents (Fig 1-2,

see for example that the intelligent software in the local expert represent the subset of machines).

g. **Regarding claim 9**, the combination of Reid and Hays discloses all the limitations of the base claims as outlined above. Reid further discloses at least a subset of the plurality of machines are physically located remote from one another (Fig 2 and C4 L53-62, note that this feature is inherent to the machines taught in Reid. Machines, such as engines and turbines, are located separate from one another; without coming into physical contact with each other. Also note that the site 12, as exemplified in Fig 1, includes a plurality of machines 14. The machines 14 may each be the same kind of machine or different machines).

h. **Regarding claim 39**, Reid discloses an industrial automation layout methodology, comprising: employing a processor executing compute executable instructions stored on a computer readable storage medium to implement the following acts: analyzing machine related prognostic data to correlate operation among plurality of machines(C3 L13-44 and C5 L3-21, see for example automatic collecting and analyzing data related to predicting a future condition); analyzing business concern data (C3 L20-25; note that identifying and recommending the replacement of a part of a machine is considered as a analyzing business concern data); analyzing business objective data (C3 L20-25, note that identifying and recommending the replacement of a part of a machine is

considered as a analyzing business objective data);

specifying machine acquisition based at least in part upon the analyses (C3 L20-25, see for example specifying part numbers of the bearings that need to be replaced).

But Reid fails to clearly specify obtaining a system set point, an allowable range of operation and machine performance information; selecting a desired operating point within the allowable range of operation about the system set point according to performance characteristics associated with at least one of the plurality of machines; and controlling at least one component according to the desired operating point.

However, Hays teaches obtaining a system set point, an allowable range of operation and machine performance information; selecting a desired operating point within the allowable range of operation about the system set point according to performance characteristics associated with at least one of the plurality of machines; and controlling the at least one component according to the desired operating point (C20 L56-58, note that in order to adjust and control the pump operation so that it could operate closer to the best efficient point, BEP, it is necessary to obtain a set point, an allowable range operation about the set point, and finally select an operating point within the allowable range. Note that the components of the system characterize the machine performance information and the allowable range of operation).

Reid and Hays are analogous art because they are from the same field of endeavor. They both relate to diagnostic systems.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings disclosed by Reid and combining them with the teachings disclosed by Hays.

One of ordinary skill in the art would have been motivated to do this modification in order to effectively determine the root cause for bearing failure of rotating equipment as suggested by Hays (see for example, C5 L54-56).

Please note that the tem "for a global optimization of the plurality of machines as a whole" is being considered as an intended use.

i. **Regarding claim 44**, Reid discloses a system that facilitates optimizing industrial business operations, comprising: a processor; a memory communicatively coupled to the processor, the memory having stored therein computer-executable instructions configured to implement the industrial business operations including: a component that receives data relating to a state of a subset of machines that are part of the industrial business operations (C3 L32-34, see for example data collecting and analyzing); a prognostics engine that infers future state of at least a subset of the operations based in part on the received data (C2 L54-64, note that the local experts are being interpreted as the "prognostic engine"; and a "forecast or prediction" is being interpreted as a

"prognostic". The diagnoses performed by each local expert can be used to alert appropriate personnel of impending failure, wear such as bearing wear, necessary maintenance, etc. The system enables a local expert to initiate electronic mail messages and/or electronic pages to appropriate personnel indicating a machine failure or impending failure, a need for maintenance, etc), the prognostics engine comprising a plurality of intelligent software machine agents and business agents that serve as proxies for at least the subset of machines, for modeling and representing interactions with one another, and for facilitating convergence on modification and control of the subset of machines (Fig 3 and C3 L20-25, C8 L54-67, C9 L1-24 and C13 L24-43, see for example that the local expert is computer driven and receives data from up to thirty-two different machines located at the site. The local expert comprises an expert system that utilizes information specific to a machine connected thereto, as well as information relating to machines of the same type. Based on such information, the local expert ascertains which machines are operating normally, or are experiencing minor, moderate or severe problems. Since identifying and recommending replacement of a part of a machine is considered as a business decision, the software in the local expert is an intelligent software business agent. Note that in general terms an agent is an entity software used to communicate with the network control host and a proxy is a software that acts as a barrier between a network and the Internet).

But Reid fails to clearly specify and an optimization component that selects a desired operating point as an optimum performance point within an allowable range of operation about a system set point according to performance characteristic associated with at least one of the components in the system and controls at least one component according to the desired operating point.

However, Hays teaches an optimization component that selects a desired operating point as an optimum performance point within an allowable range of operation about a system set point according to performance characteristic associated with at least one component in the system and controls at least one component according to the desired operating point (C20 L56-58, note that in order to adjust and control the pump operation so that it could operate closer to the best efficient point, BEP, it is necessary to obtain a set point, an allowable range operation about the set point, and finally select an operating point within the allowable range. Note that the components of the system characterize the machine performance information and the allowable range of operation).

Reid and Hays are analogous art because they are from the same field of endeavor. They both relate to.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings disclosed by Reid and combining them with the teachings disclosed by Hays.

One of ordinary skill in the art would have been motivated to do this modification in order to effectively determine the root cause for bearing failure of rotating equipment as suggested by Hays (see for example, C5 L54-56).

Please note that in order to secure a desired operating characteristic and properly control a system it is necessary to obtain machine characteristic information and the allowable range of operation of the machine. It is known in this art that a system set point should be within the allowable range of operation and any other desired operating point should also be within the allowable range of operation. The allowable range of operation and the machine performance information of the system depends on the components that makeup the system.

Please note that the term "for a performance optimization of the industrial automation system as whole" is being considered as an intended use.

j. **Regarding claim 45**, the combination of Reid and Hays discloses all the limitations of the base claims as outlined above. Reid further discloses a prognostic engine infers future business conditions (C3 L20-25; note that the local expert identifying and recommending the replacement of a part of a machine is considered as inferring a future business condition).

a. **Regarding claim 47**, Reid discloses a system that facilitates optimizing industrial business operations, comprising: a memory communicatively coupled

to the processor, the memory having stored therein computer-executable instructions configured to implement the industrial business operations including: a component that receives data relating to state of the industrial business operations (C3 L32-34, see for example data collecting and analyzing); a prognostics engine that infers future state of at least a subset of the industrial business operations based in part on the received data (C2 L54-64, note that the local experts are being interpreted as the "prognostic engine"; and a "forecast or prediction" is being interpreted as a "prognostic". The diagnoses performed by each local expert can be used to alert appropriate personnel of impending failure, wear such as bearing wear, necessary maintenance, etc. The system enables a local expert to initiate electronic mail messages and/or electronic pages to appropriate personnel indicating a machine failure or impending failure, a need for maintenance, etc), the prognostics engine comprising a plurality of intelligent software machine agents and business agents for modeling and representing interactions between a subset of machines, for efficiently optimizing the industrial business operations (Fig 3 and C3 L20-25, C8 L54-67, C9 L1-24 and C13 L24-43, see for example that the local expert is computer driven and receives data from up to thirty-two different machines located at the site. The local expert comprises an expert system that utilizes information specific to a machine connected thereto, as well as information relating to machines of the same type. Based on such information, the local expert ascertains which machines are operating normally, or are experiencing minor, moderate or severe problems.

Since identifying and recommending replacement of a part of a machine is considered as a business decision, the software in the local expert is an intelligent software business agent. Note that in general terms an agent is an entity software used to communicate with the network control host).

But Reid fails to clearly specify an optimization component that selects a desired operating point as an optimum performance point within an allowable range of operation about a system set point according to performance characteristic associated with the industrial business operations at least one of the components in the system and controls at least one component according to the desired operating point.

However, Hays teaches an optimization component that selects a desired operating point as an optimum performance point within an allowable range of operation about a system set point according to performance characteristic associated with the industrial business operations at least one component in the system and controls at least one component according to the desired operating point (C20 L56-58, note that in order to adjust and control the pump operation so that it could operate closer to the best efficient point, BEP, it is necessary to obtain a set point, an allowable range operation about the set point, and finally select an operating point within the allowable range. Note that the components of the system characterize the machine performance information and the allowable range of operation).

Reid and Hays are analogous art because they are from the same field of endeavor. They both relate to diagnostic systems.

Reid and Hays are analogous art because they are from the same field of endeavor. They both relate to.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings disclosed by Reid and combining them with the teachings disclosed by Hays.

One of ordinary skill in the art would have been motivated to do this modification in order to effectively determine the root cause for bearing failure of rotating equipment as suggested by Hays (see for example, C5 L54-56).

Please note that in order to secure a desired operating characteristic and properly control a system it is necessary to obtain machine characteristic information and the allowable range of operation of the machine. It is known in this art that a system set point should be within the allowable range of operation and any other desired operating point should also be within the allowable range of operation. The allowable range of operation and the machine performance information of the system depends on the components that makeup the system.

Please note that the term "for a global optimization of the industrial business operation as a whole" is being considered as an intended use.

l. **Regarding claim 48**, the combination of Reid and Hays discloses all the limitations of the base claims as outlined above. Hays further discloses wherein

an optimization component correlates component performance information associated with one ore more components in a system comprising at least a pump, a motor and a motor drive in order to derive correlated process performance information (This limitation is inherent to the system taught by Hays).

m. **Regarding claim 49**, the combination of Reid and Hays discloses all the limitations of the base claims as outlined above. Hays further discloses wherein an optimization component selects a desired operating point as an optimum performance point within an allowable range of operation according to a correlated process performance (this limitation is inherent to the system taught by Hays).

23. Claims 3 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reid et al. U.S. Patent No. 6,298,308 (hereinafter Reid) in view of Hays et al. U.S. Patent No. 6,330,525 (hereinafter Hays) and in view of Roemer et al., "Advanced Diagnostics and Prognostics for Gas turbine Engine Risk Assessment", IEEE 2000 (hereinafter Roemer).

a. **Regarding claim 3**, the combination of Reid and Hays discloses all the limitations of the base claims as outlined above.

But the combination of Reid and Hays fails to clearly specify the prognostic engine comprising a classifier.

However, Roemer teaches a prognostic engine comprising a classifier (Figure 2, Page 346 C1 L1-24 and Page 347 C1 L1-5, see for example that the prognostic algorithm uses the diagnostic system. Note that the diagnostic system/algorithm has a classifier).

Reid, Hays and Roemer are analogous art because they are from the same field of endeavor. They all relate to diagnostic systems.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings disclosed by Reid and Hays and combining them with the teachings disclosed by Roemer.

One of ordinary skill in the art would have been motivated to do this modification in order to reduce the life cycle costs as suggested by Roemer (see for example the Conclusion).

b. **Regarding claim 7**, the combination of Reid, Hays and Roemer discloses all the limitations of the base claims as outlined above. Roemer further discloses a classifier that performs a probabilistic analysis in connection with inference (Figure2, Page 346 C1 L1-24 and Page 347 C1 L1-5, see for example that the prognostic algorithm uses the diagnostic system. Note that the diagnostic system/algorithm has a classifier. Also note that the diagnostic results will be combined with past history information to train real-time algorithms , such as a neural networks or real-time probabilistic models, to continuously update the projections on remaining life).

24. Claim 46 is rejected under 35 U.S.C. 103(a) as being unpatentable over Reid et al. U.S. Patent No. 6,298,308 (hereinafter Reid) in view of Hays et al. U.S. Patent No. 6,330,525 (hereinafter Hays) and in view of Burris et al. U.S. Publication 2003/0208394 (hereinafter Burris).

a. **Regarding claim 46**, the combination of Reid and Hays discloses all the limitations of the base claims as outlined above.

But the combination of Reid and Hays fails to clearly specify the future business conditions comprising at least one of future raw materials and future product demand

However, Burris discloses future business conditions comprising at least one of future raw materials and future product demand (Claim 22 -- see for example predicting a demand for raw material).

Reid, Hays and Burris are analogous art because they are from the same field of endeavor. They all relate to supervisory control systems.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings disclosed by Reid and Hays and combining them with the teachings disclosed by Burris.

One of ordinary skill in the art would have been motivated to do this modification in order to accurately perform a forecast as suggested by Burris (see for example Paragraph 0030).

25. Claims 10, 13, 15-17, 19-22, 24-29 and 32-35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reid et al. U.S. Patent No. 6,298,308 (hereinafter Reid) in view of Soneda et al. U.S. Patent No. 6,619,111 (hereinafter Soneda) and in view of Hays et al. U.S. Patent No. 6,330,525 (hereinafter Hays).

a. **Regarding claim 10**, Reid discloses a method that optimizes assets in an industrial automation environment, comprising: employing a processor executing computer executable instructions stored on a computer readable storage medium to implement the following acts: receiving and analyzing in real-time data relating to diagnoses and prognoses of operational aspects of a subset of machines that are part of the industrial automation system (C3 L32-34, see for example data collecting and analyzing); modeling and representing interactions of the subset of machines, for facilitating convergence on modification and control of the subset of machines (Fig 3 and C3 L20-25, C8 L54-67, C9 L1-24 and C13 L24-43, see for example that the local expert is computer driven and receives data from up to thirty-two different machines located at the site. The local expert comprises an expert system that utilizes information specific to a machine connected thereto, as well as information relating to machines of the same type. Based on such information, the local expert ascertains which machines are operating normally, or are experiencing minor, moderate or severe problems. Since identifying and recommending replacement of a part of a machine is considered as a business decision, the software in the local expert is an intelligent software business agent. Note that in general terms an agent is an entity software used to

communicate with the network control host and a proxy is a software that acts as a barrier between a network and the Internet); modifying asset utilization in the industrial automation system based at least in part as a function of the analyzed diagnostic and prognostic machine data (C3 L20-25, replacing a part of a machine based on data identified by the local expert is being considered a modifying asset utilization).

But Reid fails to clearly specify correlating at least two of motor efficiency information, pump efficiency information, and motor drive efficiency information to derive correlated system efficiency information and optimize the entire industrial automation system as a whole; selecting a desired operating point as an optimum efficiency point within an allowable range of operation about a system set point associated with the industrial automation system according to the correlated system efficiency information. Reid further fails to specify controlling at least one machine according to the desired operating point.

However, Soneda discloses correlating at least two of motor efficiency information, pump efficiency information, and motor drive efficiency information to derive correlated system efficiency information and optimize the entire industrial automation system as a whole; selecting a desired operating point as an optimum efficiency point within an allowable range of operation about a system set point associated with the industrial automation system according to the correlated system efficiency information (note that the motor input is being interpreted as motor efficiency information and pump flow is being interpreted as

pump efficiency information; Fig 7- see for example correlating motor input and the pump flow in order to derive correlated speed efficient information; C7 L4-43 - see preparing correlation equations for each of the speeds; Fig 1, Fig 3, Fig 6, C7 L4-43 – see selecting the pump speed that is closer to the actual allowable plant speed according to the motor input and the pump flow).

Reid and Soneda are analogous art because they are from the same field of endeavor. They both relate to monitoring performance of a machine.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings disclosed by Reid and combining them with the teachings disclosed by Soneda.

One of ordinary skill in the art would have been motivated to do this modification in order to enable an operator to easily monitor a machine performance trend as suggested by Soneda (see for example, C9 L1-2).

The combination of Reid and Soneda fails to clearly specify controlling at least one machine according to the desired operating point.

However, Hays discloses controlling at least one machine according to a desired operating point (Fig 3, Fig 5a-e, Fig 6b and C9 L10-30, C19 L13-67 and C20 L1-67, see for example controlling and adjusting a pump's operation closer to the best efficient point BEP using pump performance curves).

Reid, Soneda and Hays are analogous art because they are from the same field of endeavor. They all relate to monitoring performance of a machine.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings disclosed by the combination of Reid and Soneda and combining them with the teachings disclosed by Hays.

One of ordinary skill in the art would have been motivated to do this modification in order to effectively determine the root cause for bearing failure of rotating equipment as suggested by Hays (see for example, C5 L54-56).

b. **Regarding claim 13**, the combination of Reid, Soneda and Hays discloses all the limitations of the base claims as outlined above. Hays further discloses obtaining a system set point and an allowable range of operation from a user (C7, C8 and C9 L1-30).

c. **Regarding claim 15**, the combination of Reid, Soneda and Hays discloses all the limitations of the base claims as outlined above. Hays further discloses wherein controlling an industrial automation system according to a desired operating point comprises providing a motor speed signal to a motor drive associated with the industrial automation system according to the desired operating point (Fig 3, Fig 5a-e, Fig 6b and C9 L10-30, C19 L13-67 and C20 L1-67, see for example controlling and adjusting a pump's operation closer to the best efficient point BEP using pump performance curves).

d. **Regarding claim 16**, the combination of Reid, Soneda and Hays discloses all the limitations of the base claims as outlined above. Hays further discloses obtaining at least one of an efficiency information, an allowable range, and a system set point from a user (C7, C8 and C9 L1-30).

e. **Regarding claim 17**, the combination of Reid, Soneda and Hays discloses all the limitations of the base claims as outlined above. Hays further discloses obtaining at least one of an efficiency information, an allowable range, and a system set point from a host computer via a network (C7, C8 and C9 L1-30).

f. **Regarding claim 19**, the combination of Reid, Soneda and Hays discloses all the limitations of the base claims as outlined above. Hays further discloses wherein the at least one of an efficiency information, an allowable range, and a system set point is obtained via wireless communications (C7, C8 and C9 L1-30).

g. **Regarding claim 20**, the combination of Reid, Soneda and Hays discloses all the limitations of the base claims as outlined above. Hays further discloses obtaining at least a portion of one of an efficiency information, an allowable range, and a set point from prior operation of the system (this limitation is inherent to the system described in the Hays reference).

h. **Regarding claim 21-22 and 24-29**, the combination of Reid, Soneda and Hays discloses all the limitations of the base claims as outlined above. However, note that due to the unclear language of claim 21, as indicated above in Item #12f of this Office Action, it is not possible to determine the subject matter which the applicant regards as his invention. Therefore for purposes of art rejection these claims are being broadly interpreted and rejected under the same reasoning presented for base claim 10.

i. **Regarding claim 32**, the combination of Reid, Soneda and Hays discloses all the limitations of the base claims as outlined above. Hays further discloses wherein selecting a desired operating point comprises measuring at least one process variable from a sensor associated with the industrial automation system (see Abstract).

j. **Regarding claim 33**, Reid discloses a system that optimizes assets in an industrial automation environment, comprising: processing means for processing data from a memory having stored therein compute-executable instructions configured to implement the industrial business operations including: means for receiving and analyzing in real-time data relating to prognoses of operational aspects of machines and/or business components that are part of the industrial automation system (C3 L32-34, see for example data collecting and analyzing);

means for modeling and representing interactions between the machines and/or business components (Fig 3 and C3 L20-25, C8 L54-67, C9 L1-24 and C13 L24-43, see for example that the local expert is computer driven and receives data from up to thirty-two different machines located at the site. The local expert comprises an expert system that utilizes information specific to a machine connected thereto, as well as information relating to machines of the same type. Based on such information, the local expert ascertains which machines are operating normally, or are experiencing minor, moderate or severe problems. Since identifying and recommending replacement of a part of a machine is considered as a business decision, the software in the local expert is an intelligent software business agent. Note that in general terms an agent is an entity software used to communicate with the network control host and a proxy is a software that acts as a barrier between a network and the Internet);
means for regulating a subset of the machines and/or business components based at least in part as a function of analyzed diagnostic and prognostic machine data (C3 L20-25, replacing a part of a machine based on data identified by the local expert is being considered as regulating machines and/or business components).

But Reid fails to clearly specify means for correlating at least two of motor efficiency information, pump efficiency information, and motor drive efficiency information in order to derive correlated system efficiency information; means for selecting a desired operating point within an allowable range of operation about a

system set point according to the correlated system efficiency information. Reid further fails to clearly specify means for controlling at least one machine according to the desired operating point.

However, Soneda discloses means for correlating at least two of motor efficiency information, pump efficiency information, and motor drive efficiency information in order to derive correlated system efficiency information; means for selecting a desired operating point within an allowable range of operation about a system set point according to the correlated system efficiency information (note that the motor input is being interpreted as motor efficiency information and pump flow is being interpreted as pump efficiency information; Fig 7- see for example correlating motor input and the pump flow in order to derive correlated speed efficient information; C7 L4-43 - see preparing correlation equations for each of the speeds; Fig 1, Fig 3, Fig 6, C7 L4-43 – see selecting the pump speed that is closer to the actual allowable plant speed according to the motor input and the pump flow).

Reid and Soneda are analogous art because they are from the same field of endeavor. They both relate to monitoring performance of a machine.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings disclosed by Reid and combining them with the teachings disclosed by Soneda.

One of ordinary skill in the art would have been motivated to do this modification in order to enable an operator to easily monitor a machine performance trend as suggested by Soneda (see for example, C9 L1-2).

The combination of Reid and Soneda fails to clearly specify controlling at least one machine according to the desired operating point.

The combination of Reid and Soneda fails to clearly specify means for controlling at least one machine according to the desired operating point.

However, Hays discloses means for controlling at least one machine according to a desired operating point (Fig 3, Fig 5a-e, Fig 6b and C9 L10-30, C19 L13-67 and C20 L1-67, see for example controlling and adjusting a pump's operation closer to the best efficient point BEP using pump performance curves).

Reid, Soneda and Hays are analogous art because they are from the same field of endeavor. They all relate to monitoring performance of a machine.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings disclosed by the combination of Reid and Soneda and combining them with the teachings disclosed by Hays.

One of ordinary skill in the art would have been motivated to do this modification in order to effectively determine the root cause for bearing failure of rotating equipment as suggested by Hays (see for example, C5 L54-56).

Please note that the term "for optimizing an entire operation of the industrial automation system" is being considered as an intended use.

k. **Regarding claim 34**, the combination of Reid, Soneda and Hays discloses all the limitations of the base claims as outlined above. Reid further discloses comprising means for inferring future states of a subset of machines (C2 L54-64, note that the local expert(s) are being interpreted as the “prognostic engine". Note that the diagnoses performed by each local expert can be used to alert appropriate personnel of impending failure, wear such as bearing wear, necessary maintenance, etc. The system enables a local expert to initiate electronic mail messages and/or electronic pages to appropriate personnel indicating a machine failure or impending failure, a need for maintenance, etc).

l. **Regarding claim 35**, the combination of Reid, Soneda and Hays discloses all the limitations of the base claims as outlined above. Reid further discloses comprising means for inferring future states of a subset of business components (C2 L54-64, note that the local expert(s) are being interpreted as the “prognostic engine". Note that the diagnoses performed by each local expert can be used to alert appropriate personnel of impending failure, wear such as bearing wear, necessary maintenance, etc. The system enables a local expert to initiate electronic mail messages and/or electronic pages to appropriate personnel indicating a machine failure or impending failure, a need for maintenance, etc).

26. Claims 12 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reid et al. U.S. Patent No. 6,298,308 (hereinafter Reid) in view of Soneda et al. U.S. Patent No. 6,619,111 (hereinafter Soneda) in view of Hays et al. U.S. Patent No. 6,330,525 (hereinafter Hays) and in view of Eryurek et al U.S. Patent No. 6,795,798 (hereinafter Eryurek).

a. **Regarding claim 12**, the combination of Reid, Soneda and Hays discloses all the limitations of the base claims as outlined above.

But the combination of Reid, Soneda and Hays fails to clearly specify employing an options based analysis in connection with asset management.

However, Eryurek discloses employing an options based analysis in connection with asset management (C9 L24-67, C10, C13, C18 L26-56, C34 L66-67, C356 L1-15, C40 L57-67 and C41 L1-48, more specifically see C10 L50-67- sending either the same or different sets of data to each of the user interface routines; and C9 L35-36 – providing maintenace data and device status information).

Reid, Soneda, Hays and Eryurek are analogous art because they are from the same field of endeavor. They all relate to monitoring performance of a machine.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings disclosed by Reid, Soneda and Hays and combining them with the teachings disclosed by Eryurek.

One of ordinary skill in the art would have been motivated to do this modification in order to decrease the time required to recognize that an asset needs to be fixed as well as the time it takes to receive the parts necessary to provide corrective action with respect to maintenance issues as suggested by Eryurek (see for example, C13 L20-25).

b. **Regarding claim 23**, the combination of Reid, Soneda, Hays and Eryurek discloses all the limitations of the base claims as outlined above. Eryurek further discloses automatically ordering an asset via the Internet (C9 L63-67 and 10 L 1-18 and C13 L1-160-- see for example automatically ordering parts in combination with he predictive controller based on predictions or future needs).

27. Claims 30-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reid et al. U.S. Patent No. 6,298,308 (hereinafter Reid) in view of Soneda et al. U.S. Patent No. 6,619,111 (hereinafter Soneda) and in view of Hays et al. U.S. Patent No. 6,330,525 (hereinafter Hays) and in view of Admitted Prior Art (hereinafter APA).

a. Regarding APA, please note that the Pages and Line numbers mentioned in this office action refer to the Original Specification of the Instant Application filed 09/30/03.

b. **Regarding claim 30**, the combination of Reid, Soneda and Hays discloses all the limitations of the base claims as outlined above.

But the combination of Reid, Soneda and Hays fails to clearly specify wherein the industrial automation system comprises a motorized pump system having an electric motor operatively coupled with a pump, and a motor drive providing electrical power to the motor, and wherein performance characteristics associated with a plurality of components in the industrial automation system comprises life expectancies of at least two of the motor, the pump, and the motor drive

However, APA discloses wherein an industrial automation system comprises a motorized pump system having an electric motor operatively coupled with a pump, and a motor drive providing electrical power to the motor, and wherein a performance characteristics associated with a plurality of components in the industrial automation system comprises life expectancies of at least two of the motor, the pump, and the motor drive (Page 3 Lines 7-31 and Page 4 Lines 1-6).

Reid, Soneda, Hays and APA are analogous art because they are from the same field of endeavor. They all relate to monitoring performance of a machine.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings disclosed by the combination of Reid, Soneda and Hays and combining them with the teachings disclosed by APA.

One of ordinary skill in the art would have been motivated to do this modification in order to effectively determine the root cause for bearing failure of rotating equipment as suggested by Hays (see for example, C5 L54-56).

c. **Regarding claim 31**, the combination of Reid, Soneda and Hays discloses all the limitations of the base claims as outlined above.

But the combination of Reid, Soneda and Hays fails to clearly specify wherein the industrial automation system comprises a motorized pump system having an electric motor operatively coupled with a pump, and a motor drive providing electrical power to the motor, and wherein performance characteristics associated with a plurality of components in the industrial automation system comprises cost of operation associated with at least two of the motor, the pump, and the motor drive.

However, APA discloses wherein an industrial automation system comprises a motorized pump system having an electric motor operatively coupled with a pump, and a motor drive providing electrical power to the motor, and wherein a performance characteristics associated with a plurality of components in the industrial automation system comprises cost of operation associated with at least two of the motor, the pump, and the motor drive (Page 3 Lines 7-31 and Page 4 Lines 1-6).

Reid, Soneda, Hays and APA are analogous art because they are from the same field of endeavor. They all relate to monitoring performance of a machine.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings disclosed by the combination of Reid, Soneda and Hays and combining them with the teachings disclosed by APA.

One of ordinary skill in the art would have been motivated to do this modification in order to effectively determine the root cause for bearing failure of rotating equipment as suggested by Hays (see for example, C5 L54-56).

29. Claims 40-43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Eryurek et al U.S. Patent No. 6,795,798 (hereinafter Eryurek) in view of Soneda et al. U.S. Patent No. 6,619,111 (hereinafter Soneda).

a. **Regarding claim 40**, Eryurek discloses a computer-implemented method for ordering parts and optimizing assets in an industrial automation system, comprising: employing a processor executing computer executable instructions stored on a computer readable storage medium to implement the following acts: automatically receiving and analyzing data relating to a prognosis of a future

state of the industrial automation system (note that any information associated/necessary for the prediction or the forecast of a machine state is being interpreted as data relating to a prognosis of a future state of a machine; C40-67 and C41 L1- 16 - see for example monitoring and analyzing by the ASP information of efficiency parameters, costs of degradation, actual values versus predicted values, historical trending of equipment characteristics and deviation from design parameters);

automatically inferring a failure period for at least one part of the industrial automation system (C41 L1- 16 --see for example predicted operational characteristics);

automatically ordering a replacement for the at least one part prior to an inferred failure period (C9 L63-67 and 10 L 1-18 and C13 L1-160-- see for example automatically ordering parts in combination with he predictive controller based on predictions or future needs).

But Eryurek fails to clearly specify correlating component performance information associated with the industrial automation system in the machine comprising a motor efficiency information, a pump efficiency information, and a motor drive efficiency information in order to derive correlated process performance information; and selecting a desired operating point as an optimum performance point within a allowable range of operation according to the correlated process performance information.

However, Soneda discloses correlating component performance information associated with the industrial automation system in a machine comprising a motor efficiency information, a pump efficiency information, and a motor drive efficiency information in order to derive correlated process performance information; and selecting a desired operating point as an optimum performance point within a allowable range of operation according to the correlated process performance information (note that the motor input is being interpreted as motor efficiency information, and pump flow is being interpreted as pump efficiency information; Fig 7- see for example correlating motor input and the pump flow in order to derive correlated speed efficient information; C7 L4-43 - see preparing correlation equations for each of the speeds; Fig 1, Fig 3, Fig 6, C7 L4-43 – see selecting the pump speed that is closer to the actual allowable plant speed according to the motor input and the pump flow).

Eryurek and Soneda are analogous art because they are from the same field of endeavor. They both relate to monitoring performance of a machine.

Therefore at time the invention was made, it would have been obvious to a person of ordinary skill in the art to modify the above teachings disclosed by Reid and combining them with the teachings disclosed by Soneda.

One of ordinary skill in the art would have been motivated to do this modification in order to enable an operator to easily monitor a machine performance trend as suggested by Soneda (see for example, C9 L1-2).

Please note that the term "for a performance optimization of the industrial automation system as a whole" is being considered as an intended use.

a. **Regarding claim 41**, the combination of Eryurek and Soneda discloses all the limitations of the base claims as outlined above. Eryurek further discloses employing an options based scheme in connection with machine management (C9 L24-67, C10, C13, C18 L26-56, C34 L66-67, C356 L1-15, C40 L57-67 and C41 L1-48, more specifically see C10 L50-67- sending either the same or different sets of data to each of the user interface routines; and C9 L35-36 – providing maintenace data and device status information).

b. **Regarding claim 42**, the combination of Eryurek and Soneda discloses all the limitations of the base claims as outlined above. Eryurek further discloses employing an options based scheme in connection with decision support (C9 L24-67, C10, C13, C18 L26-56, C34 L66-67, C356 L1-15, C40 L57-67 and C41 L1-48, more specifically see C10 L50-67- sending either the same or different sets of data to each of the user interface routines; and C9 L32-35– providing the business persons more complete or understandable information associated with the operation of the plant).

c. **Regarding claim 43**, the combination of Eryurek and Soneda discloses all the limitations of the base claims as outlined above. Eryurek further discloses

employing an options based scheme in connection with asset optimization (C9 L24-67, C10, C13, C18 L26-56, C34 L66-67, C356 L1-15, C40 L57-67 and C41 L1-48, more specifically see C10 L50-67- sending either the same or different sets of data to each of the user interface routines; and C18 L343-57– optimization of the plant).

Conclusion

30. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carlos Ortiz-Rodriguez whose telephone number is 571-272-3766. The examiner can normally be reached on Mon-Fri 10:00 am- 6:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Paul Rodriguez can be reached on 571-272-3753. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kidest Bahta/
Primary Examiner, Art Unit 2123

Carlos Ortiz-Rodriguez
Patent Examiner
Art Unit 2123

November 24, 2009